

ABSTRACT OF THE INVENTION

A Nanomotion Sensor comprises a micromechanical device for the detection and characterization of specimen motions when they interact with one or an array of cantilevered sensors set in the path of the moving specimen. In particular, the present invention provides a method for direct sensing and characterization of motion, including position, torsion, magnitude and direction of velocity, acceleration, force, torque, as well as binding, which may include hydrogen bonding, electrostatic attractions, hydrophobic effects, dipole interactions, or through other forces through the deflection of a micromechanical cantilever sensor. The present invention is particularly useful for the detection and characterization of the motion of biological cells such as bacteria and sperm, biological systems including motor proteins, cilia of the hearing organ and the lining of the airways in asthmatics, and microfabricated systems.